

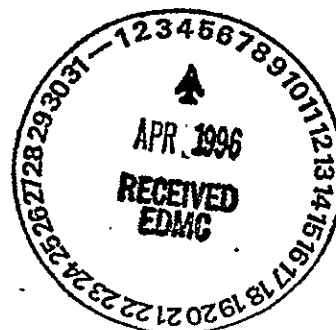
# Groundwater Maps of the Hanford Site, June 1995

Prepared for the U.S. Department of Energy  
Office of Environmental Restoration and  
Waste Management



**Westinghouse**  
**Hanford Company** Richland, Washington

Hanford Operations and Engineering Contractor for the  
U.S. Department of Energy under Contract DE-AC06-87RL10930



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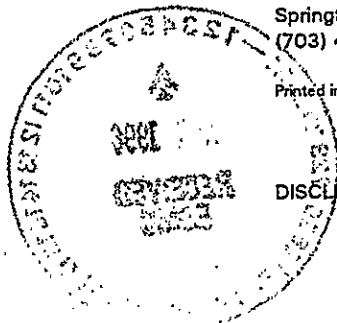
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# **Groundwater Maps of the Hanford Site, June 1995**

J. A. Serkowski  
M. J. Hartman  
M. D. Sweeney

Date Published  
March 1996

Prepared for the U.S. Department of Energy  
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## RELEASE AUTHORIZATION

**Document Number:** WHC-EP-0394-11

**Document Title:** Groundwater Maps of the Hanford Site, June 1995

**Release Date:** 03/15/96

**This document was reviewed following the  
procedures described in WHC-CM-3-4 and is:**

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**WHC Information Release Administration Specialist:**

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V. L. Birkland

3/15/96

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GROUNDWATER MAPS OF THE HANFORD SITE  
JUNE 1995

1.0 INTRODUCTION

The *Groundwater Maps of the Hanford Site, June 1995* is a continuation of a series of reports (see Serkowski et al. 1995) that document the configuration of the water table aquifer beneath the Hanford Site (Figure 1). This series presents the results of the semiannual water level measurement program and the water table maps generated from these measurements. The reports document the changes in the groundwater level at the Hanford Site during the transition from nuclear material production to environmental restoration and remediation. In addition, these reports provide water level data to support the various site characterization and groundwater monitoring programs currently in progress on the Hanford Site.

*Groundwater Maps of the Hanford Site* is prepared for the U.S. Department of Energy by the Hanford Site Operations and Engineering Contractor, Westinghouse Hanford Company (WHC). This document fulfills reporting requirements specified in WHC-CM-7-5, Section 8.0 "Water Quality" (WHC 1993a) and described in the environmental monitoring plan for the Hanford Site. (DOE-RL 1993a)

This document highlights the three major operations areas (the 100, 200 and 300/1100 Areas) where wastes were discharged to the soil. Each area includes a summary discussion of the data, a well index map, and a contoured map of the water table surface. Appendix A contains all of the data collected for this program.

The National Geodetic Vertical Datum of 1988 (NGVD88) is used as the vertical datum and Washington State Lambert coordinates are used for horizontal location of the wells. Elevation data were converted from feet to meters for this report.

## 2.0 DATA COLLECTION, MANAGEMENT, EVALUATION, AND PRESENTATION

During June 1995, the depth to groundwater was measured in 432 Hanford Site wells by personnel from the Well Services Group under the direction of the Groundwater Management Group project leader. Wells were selected for measurement using on the following criteria:

- The well must monitor only the uppermost (<15 m [50 ft]) part of the aquifer
- The screened interval of the well should not exceed 15 m and the water table should intersect the screened interval. Exceptions were made where no alternate wells exist and vertical gradients were not considered significant.
- Well location and elevation must be accurately known.

Many wells which met these criteria were not selected because an adequate number of suitable nearby wells exist. The procedure for measuring the depth to water and recording the data is contained in EII 10.2, Environmental Investigation and Site Characterization Manual WHC-CM-7-7 (WHC 1993b). Field data were collected using the Groundwater Monitoring System, which employs a barcode interface to enter readings that have been taken manually with a steel tape from the reference point at the top of the well casing. The barcode hand-held computer downloaded the field data to a supervisory workstation which stores all groundwater level measurements. These data were transferred to the Hanford Environmental Information System (HEIS) data base and were later downloaded to a <sup>1</sup>Paradox<sup>™</sup> application program called GeoDAT to help organize, evaluate, and tabulate the data.

A model grid of the water table elevations was generated using <sup>2</sup>Earthvision<sup>™</sup> geologic modeling program. The modeling software then created contour lines of equal water table elevations from the model grid. The contours and annotation information were modified on the <sup>3</sup>ARC/INFO<sup>™</sup> geographic information system (GIS) software. Contours are not present in areas where the basalt surface is believed to be above the water table, based on Connelly (1992a and 1992b).

Hydrologists familiar with regional and local groundwater properties reviewed the maps to evaluate data interpolations made by the computer model. The contours were adjusted manually to reflect the known hydrologic environment.

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ARC/INFO<sup>™</sup> - Environmental Systems Research Institute, Inc.,  
Redlands, CA 92373-8100

Earthvision<sup>™</sup> - Dynamic Graphics, Inc., 1015 Atlantic Avenue  
Alameda, CA 94501



### 3.0 HANFORD SITE MAPS

This section summarizes the results of the water table surface model generated from the June 1995 data. Figure 1 shows the relative locations of the detail facility area maps included in this document. To provide context, Figure 2 shows the water table surface for the entire Hanford Site. The detail maps are enlargements of this same sitewide model.

#### 3.1 100 AREAS MAPS

For the purposes of this report, the 100 Areas comprise the various 100 Area reactor facilities and the surrounding land south of the Columbia River and north of Gable Mountain and Gable Butte. Reactor operations have ceased in all of the facilities, and environmental restoration activities are in progress. Maps for this area include: Figure 3, Index Map of the 100 Areas Groundwater Monitoring Wells; and Figure 4, 100 Areas Water Table. Some of the wells used have screened intervals exceeding 15 meters within the top of the unconfined aquifer since the vertical gradients are not believed to be significant in this area.

High river stage in June temporarily reversed flow directions near the river. This phenomenon is commonly observed in the spring.

The high water levels north of Gable Mountain are consistent with past measurements. Driller's logs indicate the presence of fine-grained sediments in this area. The high water levels may be remnants of artificial recharge from pre-Hanford irrigation, or may represent perched groundwater. The steep groundwater gradient in the southeastern portion of the map area is believed to result from the influence of the fine-grained sediments.

#### 3.2 200 AREAS MAPS

These maps encompass the 200 East and 200 West Areas and the surrounding vicinity on the Hanford Site that was once referred to as the Separations Area. There are several active and many inactive liquid waste disposal facilities in this region. The 200 Areas set of maps consists of: Figure 5, 200 Areas Monitoring Well Index Map, and Figure 6, 200 Areas Water Table.

Three facilities are notable in their impact on the water levels in this area: U Pond (216-U-10), located in the southwestern corner of 200 West Area, Z Plant (234-5), north of the U Pond Site, and B Pond (216-B-3), located east of 200 East Area. U Pond was deactivated in 1984 after 40 years of use as a disposal site for large volumes of liquid wastes. The relatively low hydraulic conductivity found beneath 200 West Area coupled with continued effluent discharge in cribs associated with Z Plant has helped to maintain a significant water table mound under 200 West Area. Since 1984, the high point of the groundwater mound has shifted northward from U pond, toward Z Plant. A steep gradient occurs east of 200 West Area as the water table intersects the higher conductivity sediments beneath 200 East Area. With higher conductivities, the water table beneath the 200 East Area is generally flat. B Pond, which received significant volumes of liquid effluent, has a residual

groundwater mound that influences groundwater travel direction over a wide area.

### 3.3 300/1100 AREAS MAPS

This section contains a discussion on the June 1995 water table measurements for the 300 Area and the adjacent 1100 Area. Liquid waste disposal continues only at the 300 Area Process Trenches, though clean river water is discharged during the summer months at the Richland well field recharge ponds located east of the 1100 Area. The 300/1100 Area set of maps consists of: Figure 7, 300 Area Monitoring Well Index Map; and, Figure 8, 300 Areas Water Table.

The unconfined aquifer within this area is contained in the Ringold Formation and the Hanford formation (Swanson et al, 1992). The top of the unconfined aquifer is close to the Hanford/Ringold contact. Generally, west of an imaginary north-south line near the west boundary of the 300 Area the unconfined aquifer is within the Ringold Formation. East of the line it is within the Hanford formation, which is more permeable than the Ringold and may be expected to permit higher flow velocities.

The major influences on water table elevations in the map area are river fluctuations, irrigation, and river water recharged into the City of Richland well field near the 1100 Area. During the spring, high water levels in the Columbia River reverse the normal groundwater flow into the river along the shoreline. Combined with high permeabilities in the Hanford formation, these influences result in a complex flow regime where local flow directions are difficult to predict.

### 4.0 REFERENCES

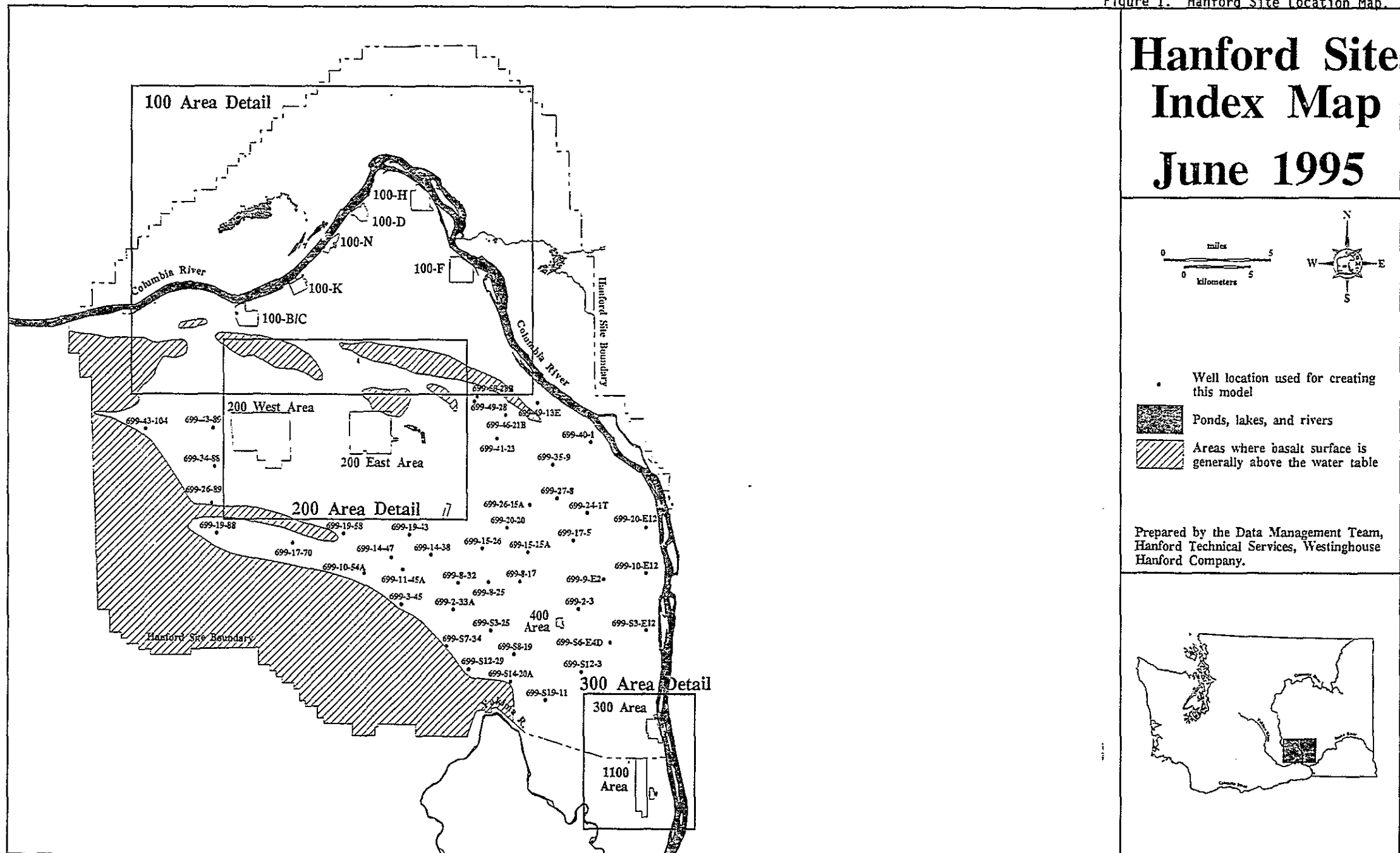
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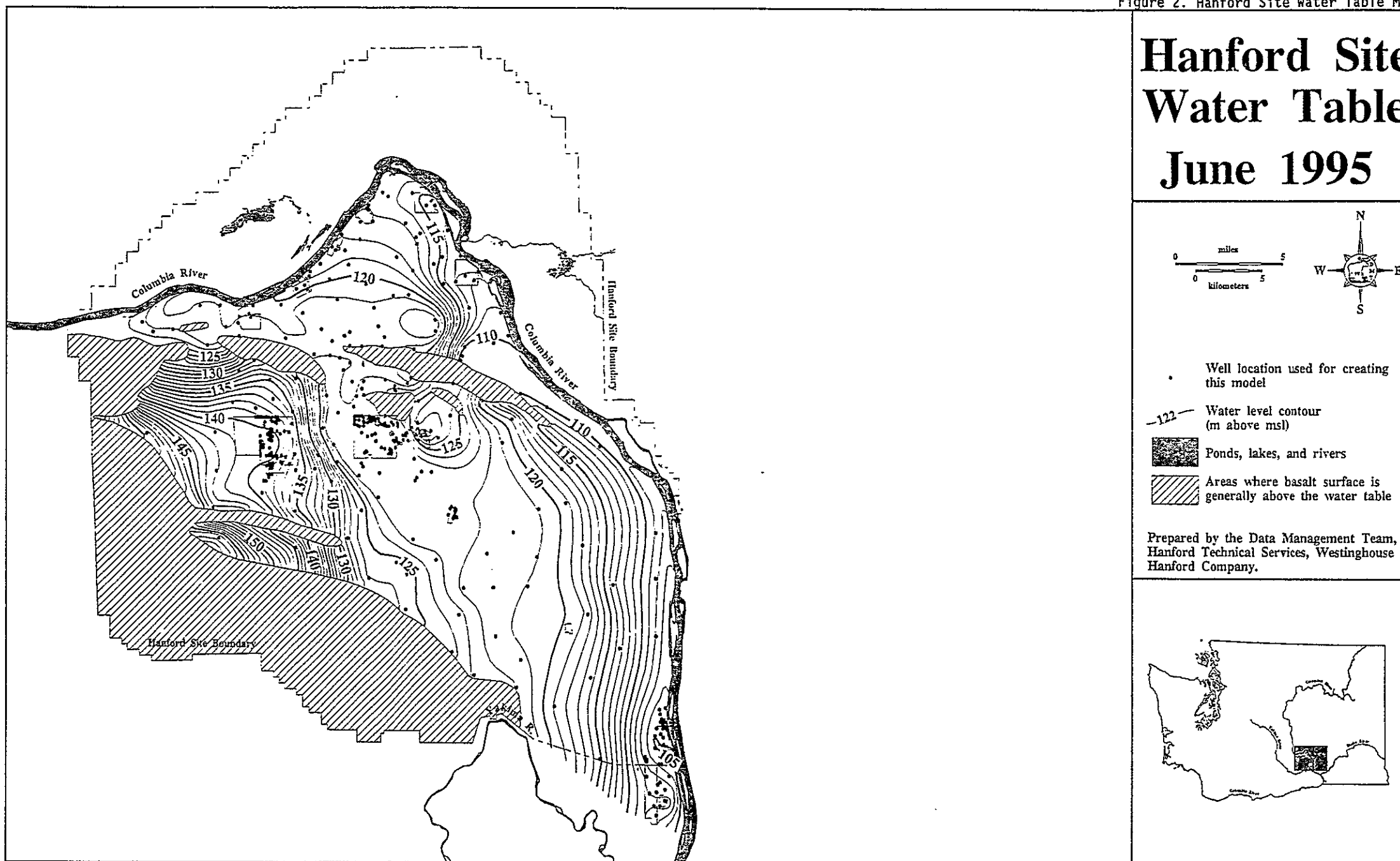
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Figure 1. Hanford Site Location Map.

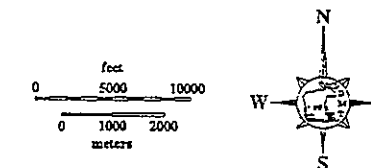
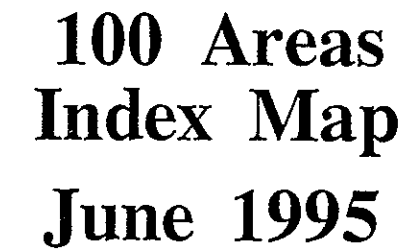


index\_ha.map-011296

Figure 2. Hanford Site Water Table Map.



wl\_ha.map-011296



Well location used for creating  
this model

## Ponds, lakes, and rivers

Areas where basalt surface is generally above the water table

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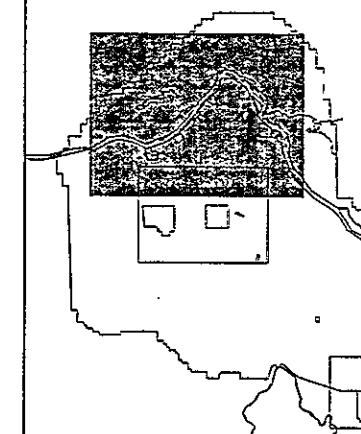
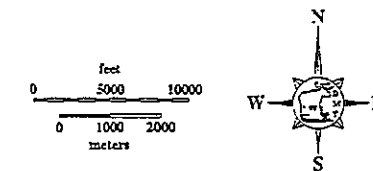


Figure 4. 100 Area Water Table Map:

# 100 Areas Water Table June 1995



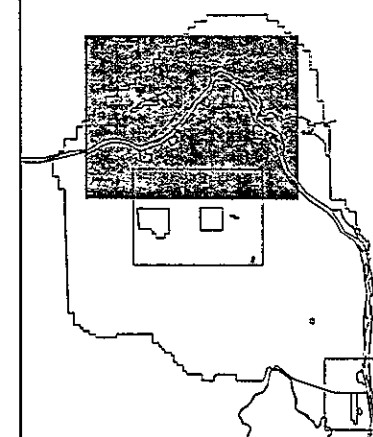
• Well location used for creating this model

—122— Water level contour (m above msl)

Ponds, lakes, and rivers

Areas where basalt surface is generally above the water table

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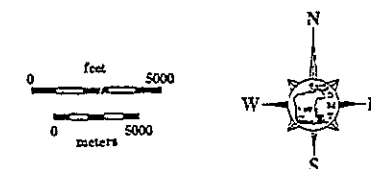


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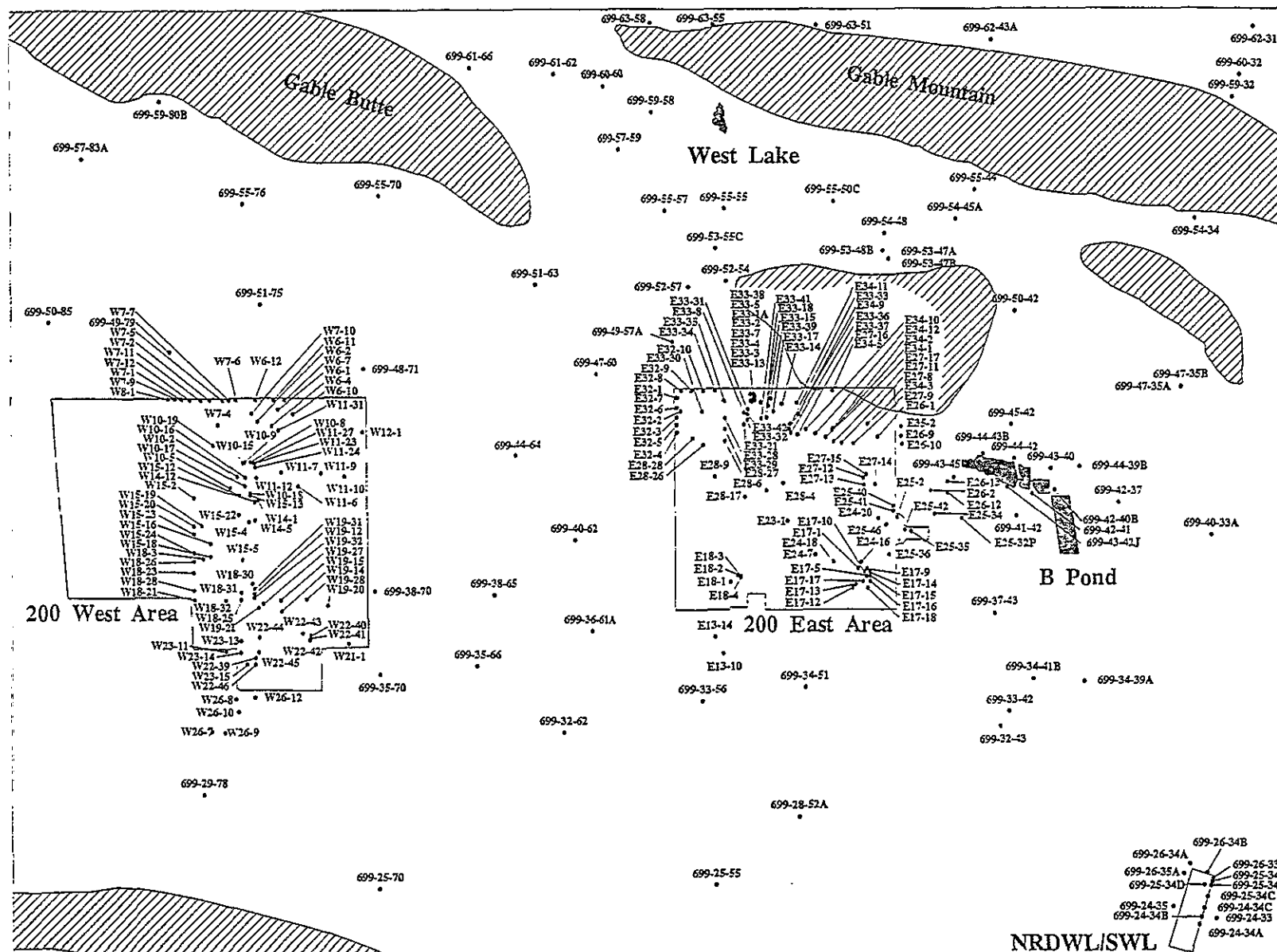
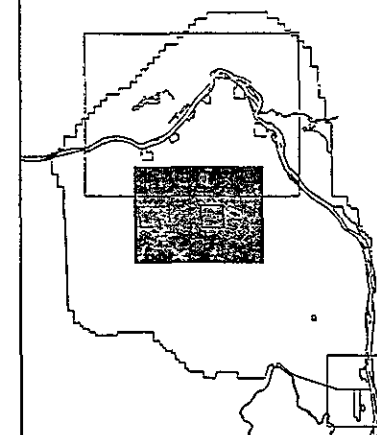
Figure 5. 200 Area Location Map.

# 200 Areas Index Map June 1995



- Well location used for creating this model
- Ponds, lakes, and rivers
- Areas where basalt surface is generally above the water table

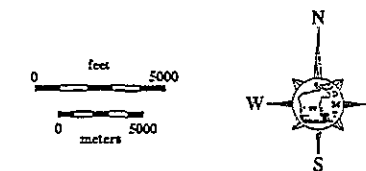
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Figure 6. 200 Area Water Table.

# 200 Areas Water Table June 1995



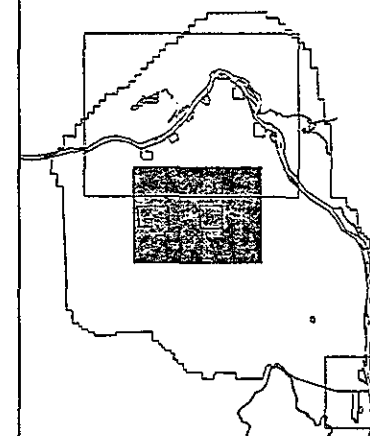
• Well location used for creating this model

—122— Water level contour (m above msl)

Ponds, lakes, and rivers

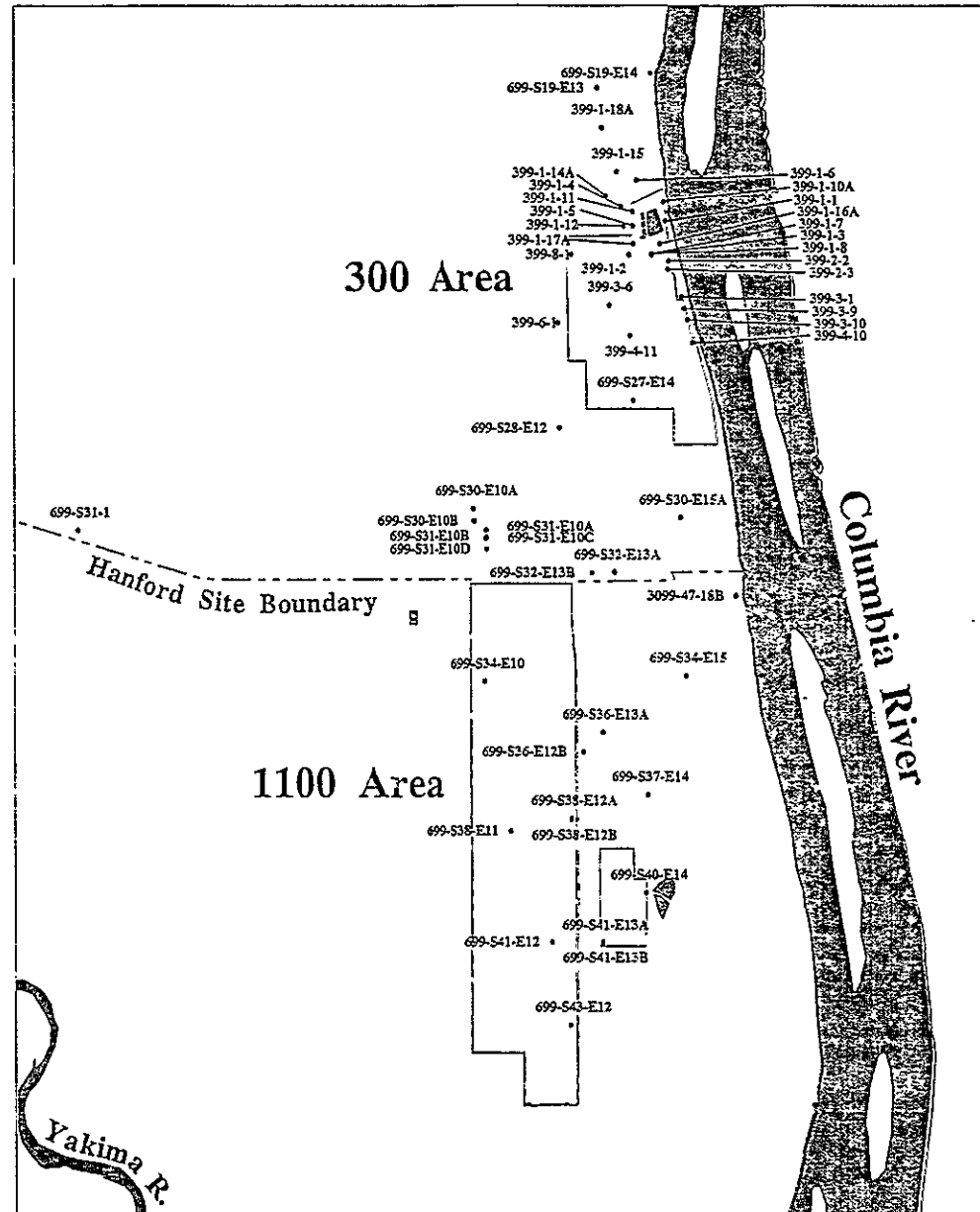
Areas where basalt surface is generally above the water table

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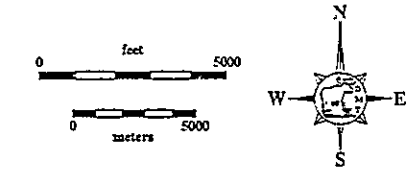


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Figure 7. 300 Area Location Map.

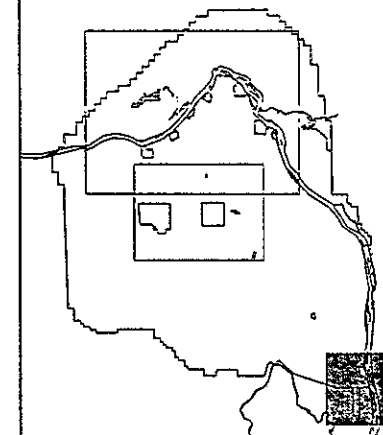


# 300 Area Index Map June 1995



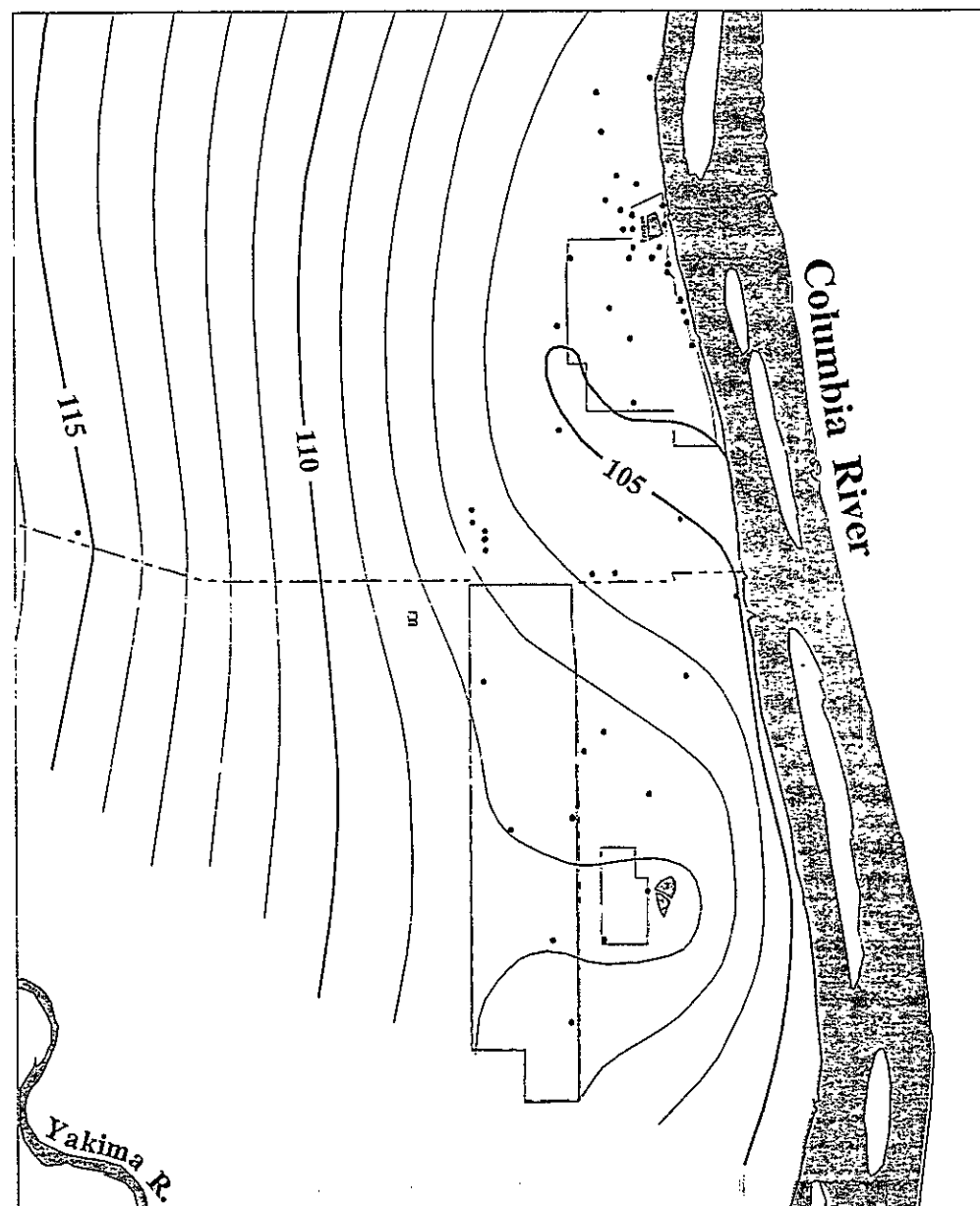
- Well location used for creating this model
- Ponds, lakes, and rivers
- Areas where basalt surface is generally above the water table

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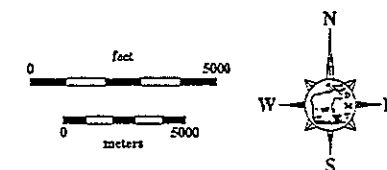


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Figure 8. 300 Area Water Table.





# 300 Area Water Table June 1995



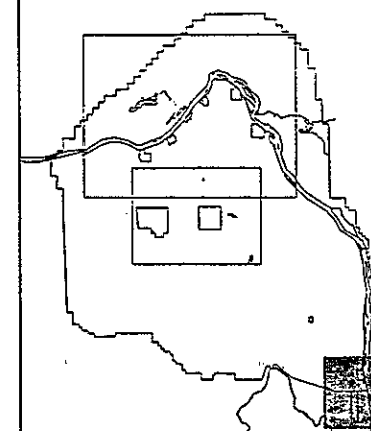
• Well location used for creating this model

—122— Water level contour (m above msl)

 Ponds, lakes, and rivers

 Areas where basalt surface is generally above the water table

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**APPENDIX A**  
**WATER LEVEL MEASUREMENT DATA**

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Appendix A: December 1994 Water Level Measurement Data  
(Sheet 1 of 10)

Well	Depth to Water (m)	Elevation, m above msl	
		Adjusted Casing	Water Level
199-B3-1	13.45	133.87	120.42
199-B4-9	22.52	143.70	121.18
199-B8-6	23.66	144.90	121.23
199-D2-5	22.98	140.30	117.32
199-D2-6	25.66	143.04	117.37
199-D5-13	26.73	143.71	116.98
199-D8-5	20.86	137.92	117.06
199-D8-6	28.18	145.24	117.06
199-F1-2	7.84	121.30	113.46
199-F5-1	10.26	123.54	113.29
199-F7-1	5.32	118.32	113.00
199-F8-1	10.64	123.70	113.06
199-F8-4	13.27	125.25	111.98
199-H4-16	14.87	129.31	114.43
199-H5-1A	13.47	128.06	114.60
199-H6-1	13.01	127.44	114.42
199-K-19	10.02	128.66	118.63
199-K-20	10.10	128.61	118.50
199-K-27	22.40	142.24	119.84
199-K-34	23.10	142.67	119.57
199-K-36	30.02	150.59	120.57
199-K-37	16.34	134.66	118.32
199-N-14	20.34	138.28	117.94
199-N-26	20.95	139.06	118.12
199-N-73	22.98	141.19	118.21
199-N-74	21.02	139.48	118.47
299-E13-10	102.80	224.85	122.05
299-E13-14	102.41	224.85	122.44
299-E17-1	97.05	219.20	122.16
299-E17-10	95.68	217.85	122.18
299-E17-12	97.77	219.97	122.20
299-E17-13	97.02	219.23	122.21
299-E17-14	97.89	220.12	122.23
299-E17-15	98.01	220.00	121.99
299-E17-16	97.45	219.63	122.19
299-E17-17	97.24	219.43	122.19
299-E17-18	97.47	219.65	122.19
299-E17-5	96.96	219.06	122.10
299-E17-9	96.56	218.74	122.18
299-E18-1	97.26	219.53	122.27
299-E18-2	97.65	219.82	122.18
299-E18-3	97.80	220.08	122.28
299-E18-4	97.64	219.93	122.29
299-E23-1	95.03	217.35	122.32

Appendix A: December 1994 Water Level Measurement Data  
(Sheet 2 of 10)

Well	Depth to Water (m)	Elevation, m above msl Adjusted Casing	Water Level
299-E24-16	96.66	218.93	122.27
299-E24-18	97.00	219.24	122.24
299-E24-20	87.76	210.09	122.33
299-E24-7	95.98	218.24	122.26
299-E25-2	83.54	205.94	122.40
299-E25-32P	82.13	204.23	122.10
299-E25-34	79.77	202.04	122.27
299-E25-35	83.23	205.55	122.32
299-E25-36	93.36	215.61	122.25
299-E25-40	80.60	202.97	122.37
299-E25-41	82.27	204.66	122.39
299-E25-42	85.91	208.27	122.35
299-E25-46	89.40	211.78	122.38
299-E26-1	65.67	188.14	122.47
299-E26-10	60.94	183.33	122.39
299-E26-12	69.79	192.25	122.46
299-E26-13	61.97	184.41	122.44
299-E26-2	71.34	193.64	122.29
299-E26-9	61.37	183.76	122.39
299-E27-11	73.85	196.07	122.23
299-E27-12	79.19	201.52	122.33
299-E27-13	81.59	203.97	122.38
299-E27-14	78.39	200.72	122.33
299-E27-15	77.05	198.99	121.94
299-E27-16	76.56	198.77	122.21
299-E27-17	71.13	193.46	122.34
299-E27-8	72.14	194.41	122.27
299-E27-9	69.50	191.78	122.29
299-E28-17	93.62	215.97	122.35
299-E28-26	87.24	209.48	122.24
299-E28-27	85.16	207.44	122.28
299-E28-28	87.01	209.26	122.25
299-E28-4	88.42	210.78	122.37
299-E28-6	91.04	213.39	122.36
299-E28-9	91.26	213.59	122.34
299-E32-1	77.71	200.00	122.29
299-E32-10	72.17	194.43	122.25
299-E32-2	82.01	204.23	122.22
299-E32-3	83.97	206.20	122.23
299-E32-4	86.82	209.06	122.24
299-E32-5	85.66	207.92	122.26
299-E32-6	81.16	203.44	122.28
299-E32-7	78.42	200.67	122.25
299-E32-8	74.52	196.76	122.24



Appendix A: December 1994 Water Level Measurement Data  
(Sheet 3 of 10)

Well	Depth to Water (m)	Elevation, m above msl	
		Adjusted Casing	Water Level
299-E32-9	73.83	196.09	122.26
299-E33-13	69.38	191.52	122.13
299-E33-14	67.32	189.60	122.28
299-E33-15	68.88	191.20	122.32
299-E33-17	70.23	192.53	122.30
299-E33-18	76.37	198.69	122.32
299-E33-2	70.29	192.55	122.26
299-E33-21	81.38	203.73	122.34
299-E33-28	80.15	202.46	122.30
299-E33-29	83.08	205.37	122.29
299-E33-3	69.91	192.20	122.29
299-E33-30	80.07	202.30	122.22
299-E33-31	75.06	197.35	122.29
299-E33-32	78.90	201.17	122.27
299-E33-33	73.01	195.19	122.18
299-E33-34	70.85	193.11	122.26
299-E33-35	73.75	195.99	122.24
299-E33-36	75.50	197.11	121.61
299-E33-37	76.79	199.04	122.25
299-E33-38	70.37	192.62	122.25
299-E33-39	67.80	189.98	122.18
299-E33-4	69.67	191.38	121.71
299-E33-41	77.32	199.63	122.31
299-E33-42	77.12	199.43	122.31
299-E33-5	71.12	193.46	122.34
299-E33-7	69.06	191.34	122.29
299-E33-8	76.08	198.42	122.34
299-E34-1	69.52	191.86	122.34
299-E34-10	72.67	195.00	122.33
299-E34-11	66.03	188.35	122.33
299-E34-12	72.44	194.72	122.27
299-E34-2	70.00	192.27	122.27
299-E34-3	64.09	186.39	122.30
299-E34-5	57.44	180.07	122.63
299-E34-9	69.32	191.62	122.30
299-E35-2	61.13	183.60	122.47
299-W10-15	65.98	206.01	140.03
299-W10-16	65.07	205.06	139.99
299-W10-17	64.28	204.47	140.19
299-W10-18	64.07	204.50	140.43
299-W10-19	68.36	208.18	139.82
299-W10-2	65.28	205.43	140.15
299-W10-5	64.54	204.92	140.38
299-W10-8	67.42	207.36	139.94

Appendix A: December 1994 Water Level Measurement Data  
(Sheet 4 of 10)

Well	Depth to Water (m)	Elevation, m above msl	
		Adjusted Casing	Water Level
299-W10-9	65.67	205.72	140.05
299-W11-10	84.45	222.17	137.71
299-W11-12	66.93	207.04	140.11
299-W11-23	69.90	209.75	139.85
299-W11-24	69.55	209.53	139.98
299-W11-27	68.96	208.87	139.91
299-W11-31	76.54	215.45	138.91
299-W11-6	79.19	218.31	139.11
299-W11-7	76.31	216.14	139.83
299-W11-9	81.90	220.35	138.45
299-W12-1	84.99	221.43	136.44
299-W14-1	63.22	203.85	140.63
299-W14-12	63.74	204.37	140.63
299-W14-5	61.81	203.18	141.36
299-W15-12	63.79	204.24	140.45
299-W15-13	63.77	204.25	140.49
299-W15-18	68.45	209.00	140.56
299-W15-19	70.26	210.80	140.54
299-W15-2	70.15	210.53	140.38
299-W15-20	72.39	212.86	140.47
299-W15-22	63.58	204.45	140.87
299-W15-23	72.72	213.20	140.49
299-W15-24	72.71	213.17	140.46
299-W15-4	60.99	201.78	140.79
299-W18-21	63.35	203.80	140.45
299-W18-23	71.93	212.39	140.46
299-W18-25	62.67	203.01	140.34
299-W18-26	72.59	213.07	140.48
299-W18-28	66.72	207.26	140.54
299-W18-3	70.69	209.70	139.01
299-W18-30	64.58	205.08	140.50
299-W18-31	62.03	202.44	140.41
299-W18-32	65.76	206.24	140.48
299-W19-12	64.73	205.21	140.47
299-W19-14	72.06	211.29	139.23
299-W19-15	71.83	211.31	139.48
299-W19-20	72.33	210.63	138.30
299-W19-21	66.74	206.90	140.16
299-W19-27	68.26	208.46	140.20
299-W19-28	75.54	214.30	138.77
299-W19-31	64.99	205.49	140.51
299-W19-32	65.29	205.71	140.42
299-W22-39	64.79	203.69	138.89
299-W22-40	72.81	210.99	138.18

Appendix A: December 1994 Water Level Measurement Data  
(Sheet 5 of 10)

Well	Depth to Water (m)	Elevation, m above msl Adjusted Casing	Water Level
299-W22-41	72.67	210.84	138.17
299-W22-42	72.74	210.74	138.00
299-W22-43	72.32	210.72	138.41
299-W22-44	67.37	206.69	139.33
299-W22-45	64.05	203.06	139.01
299-W22-46	65.71	204.58	138.86
299-W23-11	62.87	202.43	139.56
299-W23-13	63.56	203.10	139.54
299-W23-14	62.96	202.39	139.42
299-W23-15	60.70	199.78	139.08
299-W26-10	66.06	204.48	138.42
299-W26-12	67.42	205.95	138.53
299-W26-7	59.70	198.73	139.03
299-W26-8	64.36	203.09	138.73
299-W26-9	60.75	199.39	138.64
299-W6-1	75.72	214.13	138.41
299-W6-10	79.06	217.16	138.10
299-W6-11	76.09	214.23	138.14
299-W6-12	72.61	211.08	138.47
299-W6-2	72.11	211.06	138.95
299-W6-4	74.81	213.74	138.93
299-W6-7	78.60	216.49	137.90
299-W7-1	71.30	210.53	139.22
299-W7-10	71.44	210.21	138.77
299-W7-11	68.58	207.71	139.13
299-W7-12	70.46	209.68	139.22
299-W7-2	67.03	205.92	138.89
299-W7-4	65.37	204.80	139.43
299-W7-5	66.41	205.15	138.74
299-W7-6	68.15	206.85	138.70
299-W7-7	66.98	205.72	138.74
299-W7-9	71.60	210.95	139.35
299-W8-1	74.40	213.77	139.37
3099-47-18B	8.79	114.36	105.57
399-1-1	9.45	114.81	105.36
399-1-10A	8.45	113.86	105.41
399-1-11	9.85	115.13	105.28
399-1-12	11.97	117.17	105.20
399-1-14A	11.52	116.81	105.28
399-1-15	10.37	115.68	105.31
399-1-16A	11.06	116.27	105.21
399-1-17A	9.86	115.04	105.18
399-1-18A	13.71	119.11	105.40
399-1-2	12.71	117.20	104.49

Appendix A: December 1994 Water Level Measurement Data  
(Sheet 6 of 10)

Well	Depth to Water (m)	Elevation, m above ms1 Adjusted Casing	Water Level
399-1-3	12.06	117.26	105.20
399-1-4	10.73	116.00	105.27
399-1-5	10.54	115.75	105.21
399-1-6	8.53	113.94	105.41
399-1-7	12.33	117.53	105.20
399-1-8	12.12	117.31	105.19
399-2-2	9.84	115.07	105.23
399-2-3	9.20	114.43	105.23
399-3-1	11.95	117.16	105.22
399-3-10	12.29	117.45	105.17
399-3-6	14.59	119.73	105.13
399-3-9	13.09	118.29	105.20
399-4-10	10.21	115.38	105.17
399-4-11	18.17	123.28	105.11
399-6-1	13.36	118.50	105.14
399-8-1	15.61	120.74	105.13
699-10-54A	31.40	157.40	126.00
699-10-E12	22.57	131.33	108.75
699-101-48B	2.22	118.90	116.69
699-11-45A	50.77	176.35	125.58
699-14-38	33.67	156.94	123.27
699-14-47	53.42	178.99	125.57
699-15-15A	45.75	166.77	121.02
699-15-26	37.97	159.66	121.69
699-17-5	14.10	132.04	117.94
699-17-70	27.05	171.66	144.60
699-19-43	45.52	168.12	122.60
699-19-58	47.24	174.63	127.39
699-19-88	39.74	196.43	156.69
699-2-3	26.77	145.43	118.66
699-2-33A	40.35	163.49	123.14
699-20-20	32.42	154.10	121.69
699-20-E12	24.44	133.27	108.83
699-24-33	37.60	159.80	122.19
699-24-34A	40.54	162.73	122.19
699-24-34B	40.44	162.61	122.17
699-24-34C	40.18	162.33	122.16
699-24-35	42.07	164.23	122.16
699-25-34A	39.54	161.64	122.10
699-25-34B	39.22	161.36	122.14
699-25-34C	41.05	163.21	122.16
699-25-34D	41.79	163.95	122.17
699-25-55	80.66	206.24	125.58
699-25-70	56.50	191.93	135.43

Appendix A: December 1994 Water Level Measurement Data  
(Sheet 7 of 10)

Well	Depth to Water (m)	Elevation, m above msl	
		Adjusted Casing	Water Level
699-26-15A	14.00	134.92	120.92
699-26-33	41.43	163.27	121.83
699-26-34A	38.99	161.06	122.07
699-26-34B	39.45	161.63	122.17
699-26-35A	40.37	162.35	121.98
699-26-89	55.80	199.06	143.26
699-27-8	22.40	141.94	119.54
699-28-52A	85.84	208.61	122.76
699-29-78	57.83	197.21	139.38
699-3-45	28.18	153.78	125.60
699-32-43	35.17	157.47	122.29
699-32-62	85.35	215.53	130.17
699-33-42	34.95	157.28	122.32
699-33-56	95.89	218.54	122.64
699-34-39A	41.40	163.70	122.30
699-34-41B	51.71	174.01	122.30
699-34-51	102.11	224.51	122.40
699-34-88	50.74	192.88	142.14
699-35-66	88.21	221.42	133.22
699-35-70	75.22	211.29	136.07
699-35-9	35.39	152.35	116.96
699-36-61A	103.97	228.02	124.05
699-37-43	87.82	210.36	122.54
699-38-65	99.16	229.68	130.51
699-38-70	79.95	216.67	136.72
699-40-1	23.12	133.72	110.60
699-40-33A	32.95	157.90	124.95
699-40-62	104.82	227.90	123.08
699-41-23	21.42	142.19	120.77
699-41-42	70.99	196.26	125.27
699-42-37	31.81	158.31	126.51
699-42-40B	37.83	166.56	128.73
699-42-41	44.63	172.91	128.28
699-43-104	83.79	233.50	149.71
699-43-40	37.29	165.26	127.98
699-43-42J	50.05	177.30	127.24
699-43-45	59.63	182.17	122.54
699-43-89	55.07	196.34	141.27
699-44-39B	28.47	156.48	128.02
699-44-42	48.85	176.55	127.70
699-44-43B	50.97	176.82	125.85
699-44-64	97.67	221.16	123.49
699-45-42	49.52	175.97	126.45
699-46-21B	40.25	159.11	118.86

Appendix A: December 1994 Water Level Measurement Data  
(Sheet 8 of 10)

Well	Depth to Water (m)	Elevation, m above msl Adjusted Casing	Water Level
699-47-35A	19.29	145.19	125.90
699-47-35B	19.38	145.28	125.90
699-47-60	76.35	198.58	122.23
699-48-71	74.72	209.75	135.02
699-49-13E	15.80	125.80	110.00
699-49-28	43.45	163.19	119.74
699-49-57A	46.45	168.49	122.05
699-49-79	71.71	210.04	138.34
699-50-28B	44.02	163.77	119.75
699-50-42	17.35	142.29	124.94
699-50-85	87.10	225.35	138.25
699-51-63	51.32	174.30	122.98
699-51-75	59.23	195.53	136.31
699-52-19	15.24	125.30	110.06
699-52-54	51.09	173.26	122.18
699-52-57	49.19	171.24	122.05
699-53-47A	10.07	133.59	123.52
699-53-47B	10.16	133.68	123.52
699-53-48B	11.73	134.94	123.20
699-54-34	42.97	167.71	124.75
699-54-45A	29.41	150.66	121.25
699-54-48	17.25	139.30	122.05
699-55-44	37.70	158.40	120.69
699-55-50C	13.39	135.46	122.08
699-55-55	49.79	171.84	122.04
699-55-70	42.20	173.44	131.24
699-55-76	42.90	177.77	134.87
699-57-59	53.56	175.64	122.08
699-57-83A	44.58	176.14	131.56
699-59-32	19.20	129.31	110.11
699-59-58	29.69	151.77	122.08
699-59-80B	46.94	177.77	130.83
699-60-32	19.55	129.61	110.07
699-60-60	34.02	156.04	122.02
699-61-62	29.62	151.63	122.01
699-61-66	37.37	159.16	121.80
699-62-31	22.24	132.30	110.06
699-62-43A	11.23	131.78	120.55
699-63-25A	10.47	120.44	109.97
699-63-51	8.01	129.38	121.37
699-63-55	8.45	129.98	121.53
699-63-58	28.26	149.89	121.62
699-63-90	33.85	155.82	121.97
699-64-62	30.85	152.44	121.59

Appendix A: December 1994 Water Level Measurement Data  
(Sheet 9 of 10)

Well	Depth to	Elevation, m above msl		Water Level
	Water (m)	Adjusted	Casing	
699-65-22	8.76	119.18		110.42
699-65-50	21.01	142.33		121.33
699-65-59A	32.93	154.51		121.58
699-65-72	43.45	164.64		121.20
699-65-83	26.87	148.01		121.14
699-66-103	19.07	141.31		122.25
699-66-38	10.52	132.94		122.43
699-66-58	31.87	153.37		121.50
699-66-64	32.73	154.16		121.44
699-67-51	38.45	159.85		121.40
699-67-86	22.99	143.98		120.99
699-67-98	16.73	138.81		122.08
699-68-105	16.17	138.42		122.25
699-69-38	6.49	128.91		122.42
699-70-23	8.45	119.35		110.90
699-70-68	39.15	160.35		121.20
699-71-30	9.28	122.10		112.82
699-71-52	38.30	159.40		121.10
699-72-73	26.34	147.09		120.75
699-72-88	11.10	132.07		120.97
699-72-92	15.86	137.02		121.16
699-73-61	40.90	161.98		121.08
699-74-44	15.01	135.67		120.67
699-77-36	11.20	125.64		114.43
699-77-54	25.96	146.32		120.35
699-78-62	23.35	143.16		119.81
699-8-17	38.27	159.24		120.97
699-8-25	33.88	155.23		121.35
699-8-32	47.42	168.98		121.55
699-80-43S	7.86	125.81		117.95
699-81-38	8.46	123.86		115.39
699-81-58	14.55	133.96		119.41
699-83-36	12.62	127.56		114.93
699-83-47	14.47	132.67		118.21
699-86-42	7.89	124.91		117.03
699-87-42A	10.14	126.94		116.80
699-87-55	22.12	140.09		117.97
699-88-41	10.45	126.79		116.34
699-89-35	7.64	121.32		113.68
699-9-E2	14.01	127.43		113.42
699-90-45	11.61	128.48		116.87
699-96-49	11.38	127.78		116.40
699-97-43	13.24	128.58		115.33
699-97-51A	6.14	122.61		116.46

Appendix A: December 1994 Water Level Measurement Data  
(Sheet 10 of 10)

Well	Depth to Water (m)	Elevation, m above msl Adjusted Casing	Water Level
699-S12-29	25.59	148.64	123.05
699-S12-3	16.68	132.75	116.06
699-S14-20A	28.13	150.19	122.05
699-S19-11	28.60	147.44	118.85
699-S19-E13	14.73	120.25	105.52
699-S19-E14	8.40	113.95	105.56
699-S27-E14	17.47	121.82	104.35
699-S28-E12	13.57	118.80	105.23
699-S3-25	38.23	159.56	121.33
699-S3-E12	13.39	121.28	107.89
699-S30-E10	13.02	119.55	106.53
699-S30-E10	12.81	119.48	106.67
699-S30-E15	16.85	122.12	105.27
699-S31-1	24.95	140.20	115.26
699-S31-E10	10.82	117.20	106.38
699-S31-E10	10.33	116.94	106.61
699-S31-E10	10.11	116.69	106.58
699-S31-E10	9.13	115.98	106.84
699-S32-E13	13.16	118.99	105.83
699-S32-E13	14.36	120.29	105.93
699-S34-E10	8.68	116.52	107.84
699-S34-E15	16.75	123.31	106.56
699-S36-E12	13.89	121.62	107.73
699-S36-E13	14.02	121.69	107.67
699-S37-E14	16.70	124.43	107.73
699-S38-E11	13.51	121.48	107.97
699-S38-E12	15.53	123.41	107.88
699-S38-E12	15.54	123.43	107.89
699-S40-E14	14.44	122.78	108.34
699-S41-E12	14.50	122.50	108.00
699-S41-E13	16.97	125.12	108.16
699-S41-E13	16.82	124.98	108.16
699-S43-E12	15.78	123.61	107.84
699-S6-E4D	17.79	131.21	113.41
699-S7-34	36.20	160.67	124.46
699-S8-19	32.85	153.56	120.72



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